UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/873,875	06/04/2001	Christophe de Dinechin	10011596-1	5117

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EXAMINER
VO, LILIAN

ART UNIT	PAPER NUMBER
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NOTIFICATION DATE	DELIVERY MODE
06/13/2008	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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-- *The MAILING DATE of this communication appears on the cover sheet with the correspondence address* --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *19 March 2008*.
2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.
3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1 - 26* is/are pending in the application.
    4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5)☐ Claim(s) _____ is/are allowed.
6)☒ Claim(s) *1 - 26* is/are rejected.
7)☐ Claim(s) _____ is/are objected to.
8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.
10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.
    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
    a)☐ All   b)☐ Some * c)☐ None of:
      1.☐ Certified copies of the priority documents have been received.
      2.☐ Certified copies of the priority documents have been received in Application No. _____.
      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)
1)☒ Notice of References Cited (PTO-892)
2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3)☐ Information Disclosure Statement(s) (PTO/SB/08)
    Paper No(s)/Mail Date _____.
4)☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____.
5)☐ Notice of Informal Patent Application
6)☐ Other: _____.

DETAILED ACTION

1.   Claims 1 – 26 are pending.

2.   In view of the appeal brief filed on 3/19/09, PROSECUTION IS HEREBY REOPENED.

New grounds of rejection are set forth below.

To avoid abandonment of the application, appellant must exercise one of the following two

options:

        (1) file a reply under 37 CFR 1.111 (if this Office action is non-final) or a reply under 37

CFR 1.113 (if this Office action is final); or,

        (2) request reinstatement of the appeal.

    If reinstatement of the appeal is requested, such request must be accompanied by a

    supplemental appeal brief, but no new amendments, affidavits (37 CFR 1.130, 1.131 or

    1.132) or other evidence are permitted. See 37 CFR 1.193(b)(2).

Claim Rejections - 35 USC § 112

3.   The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the
> subject matter which the applicant regards as his invention.

4.   Claim 20 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for

failing to particularly point out and distinctly claim the subject matter which applicant regards as

the invention.

Claim 20 recites the limitation "the virtual application" in lines 1 - 2. There is

insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 101

5.   35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or
> any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and
> requirements of this title.

6.   Claim 22 is rejected under 35 U.S.C. 101 because they are directed to non-statutory

subject matter.

The language of independent claim 22 raises a question as to whether the claim is

directed merely to an abstract idea that is not tied to a technological art, environment or <u>machine</u>

which would result in a practical application producing a useful, concrete and tangible result to

form the basis of statutory subject matter under 35 U.S.C. 101.

Independent claim 22 does not appear to require any computer hardware to implement

the claimed invention. The claim appears to define the metes and bounds of an invention

comprised of software alone. There is no support (i.e., explicitly claimed computer hardware) in

the body of the claims. The "system" of claim 22 appears to be a system comprised entirely of

software. Software alone, without a machine, is incapable of transforming any physical subject

matter by chemical, electrical, or mechanical acts. If the "acts" of a claimed process manipulate

only numbers, abstract concepts or ideas, or signals representing any of the foregoing, the acts

are not being applied to appropriate subject matter. <u>In re Schrader</u>, 22 F.3d 290 at 294-95, 30

USPQ2d 1455 at 1458-59 (Fed. Cir. 1994). Transformation of data by a <u>machine</u> constitutes

statutory subject matter if the claimed invention as a whole accomplishes a practical application.

That is, it must produce a "useful, concrete and tangible result." State Street, 149 F.3d 1368,

1373, 47 USPQ2d 1596 at 1600-02 (Fed. Cir. 1998). MPEP 2106. State Street required

transformation of data by a machine before it applied the "useful, concrete, and tangible test."

However, State Street does not hold that a "useful, concrete and tangible result" alone, without a

machine, is sufficient for statutory subject matter. State Street, 149 F.3d at 1373, 47 USPQ2d at

1601.

Claim 22 is rejected under 35 U.S.C. 101 because the claimed invention, appearing to be

comprised of <u>software alone</u> without claiming associated <u>computer hardware</u> required for

execution, is not supported by either a specific and substantial asserted utility (i.e.,

transformation of data) or a well established utility (i.e., a practical application).

Claim Rejections - 35 USC § 102

7.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the

basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

8.   Claims 1, 2, 3 and 22 - 23 are rejected under 35 U.S.C. 102(e) as being anticipated by

Gottlieb (US 6,298,431).

9.   Regarding **claims 1 and 22**, Gottlieb discloses a method of switching context on a

processor, the method comprising:

        saving the context under software control using an inconsequential register (col. 4 lines

47 - 52 and 61 - 64, col. 6 lines 45 - 50); and

        preventing the processor from changing the context while the context is being saved (col.

5 lines 1 - 5).

10.   Regarding **claim 2**, Gottlieb discloses the inconsequential register is used as a temporary

storage in lieu of a privileged register (col. 4 lines 61 - 64).

11.   Regarding **claim 3**, Gottlieb discloses the context is saved at a predetermined interruption

point (col. 4 lines 47 - 52 and 61 - 64, col. 6 lines 45 - 50).

12.   Regarding **claim 23**, Gottlieb discloses the content of the inconsequential register is

corrupted during the context switch (col. 4 lines 61 - 64).

Claim Rejections - 35 USC § 103

13.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in
> section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are
> such that the subject matter as a whole would have been obvious at the time the invention was made to a person
> having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the
> manner in which the invention was made.

14.   Claims 4, 5 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over

Gottlieb (US 6,298,431) as applied to claim 1 above, in view of Bugion et al. (US 6,496,847,

hereinafter Bugion).

15.   Regarding **claim 4,** Gottlieb discloses the context switching between threads in the same

task or threads from different tasks (col. 4 lines 51 - 52) but did not explicitly disclose the

context switching is between a host operating system and a virtual machine application.

Nevertheless, Bugion discloses the context is switched between a host operating system and a

virtual machine application (Bugion: col. 4, lines 52 – 61: switching from HOS context to VMM

context. Col 11, lines 30 – 52), the virtual machine application controlling the context switch

(col. 11, lines 30 – 52: VMM handles directly all exceptions and interrupts that occur while

executing in the VMM context. Col. 12, lines 20 – 24: the VMM completely takes over the

machine and only voluntarily relinquishes control to the HOS). Therefore, it would have been

obvious for one of an ordinary skill in the art, to combine Bugion's teaching together with

Gottlieb because Bugion stated that any available memory space may be used to save the context

information when performing context switching ((col. 11 lines 39 - 41).

16.   Regarding **claim 5,** as modified Gottlieb discloses the use of inconsequential register is

used to pass information to the virtual machine application (Gottlieb: col. 4 lines 61 - 64).

17.   Regarding **claim 26,** as modified Gottlieb discloses the context is stored in memory other

than the inconsequential register (Bugion: col. 11 lines 30 - 52).

18.   Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Gottlieb (US

6,298,431) as applied to claim 1 above, and in view of Applicants' admitted prior art (hereinafter

AAPA).

19.   Regarding **claim 6,** Gottlieb did not clearly disclose the context switched is using an IA-

64 processor. However, according to applicants' admitted prior art, IA-64 processor is

considered a well-known architecture (specification page 1, paragraph 4). It would have been

obvious for one of an ordinary skill in the art, to implement Gottlieb's invention with an IA-64

processor to take an advantage of reducing thread switch overhead for improving processor

performance (Gottlieb: col. 3 lines 41 - 45, 63 - 65).

20.   Claims 7 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gottlieb

(US 6,298,431) as applied to claim 1 above, in view of Applicants' admitted prior art, and further

in view of Thangadurai et al. (US 7,171,547, hereinafter Thangadurai).

21.   Regarding **claim 7,** as modified Gottlieb did not clearly disclose the inconsequential

register is a caller-save register. Nevertheless, Thangadurai discloses the inconsequential

register is a caller save register (col. 1 lines 30 - 35, col. 5 lines 37 - 45). It would have obvious

for one of an ordinary skill in the art at the time the invention was made to combine as modified

Gottlieb's invention with Thangadurai to use scratch register as temporary storage for saving and

restoring instruction execution as desired (col. 3 lines 20 - 34).

22.   Regarding **claim 8,** as modified Gottlieb discloses the inconsequential register is a branch

register (col. 5 lines 37 - 45 and fig. 4).

23.   Claims 9, 10, 24 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over

Gottlieb (US 6,298,431) as applied to claim 1 above, in view of Thangadurai et al. (US

7,171,547).

24.   Regarding **claim 9,** Gottlieb did not clearly disclose restoring the context using the

inconsequential register as a temporary storage. Nevertheless, Thangadurai discloses restoring

the context using the inconsequential register as a temporary storage (col. 3 lines 20 - 34, col. 1

lines 30 - 35, col. 5 lines 37 - 45). It would have obvious for one of an ordinary skill in the art at

the time the invention was made to combine Gottlieb's invention with Thangadurai to use branch

register as temporary storage for saving and restoring instruction execution as desired

(Thangadurai: col. 3 lines 20 - 34, col. 5 lines 37 - 45).

25.   Regarding **claim 10,** as modified Gottlieb discloses the context is restored by using a

branch register to perform an indirect branch (Thangadurai: col. 3 lines 20 - 34, col. 5 lines 37 -

45).

26.   Regarding **claim 24,** Gottlieb discloses the inconsequential register includes storing an

address, the address indicating a memory location at which the context will be saved

(Thangadurai: col. 6 lines 1 - 2, 20 - 24).

27.   Regarding **claim 25,** as modified Gottlieb discloses the inconsequential register does not

store context a predetermined interruption point (Thangadurai: col. 1 lines 30 - 39).

28.   Claims 11 - 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bugion et

al. (US 6,496,847, hereinafter Bugion) in view of Gottlieb (US 6,298,431).

29.   Regarding **claim 11,** Bugion discloses a method of switching context between a host OS

and a virtual machine on a processor (col. 4 lines 52 - 61), the processor having privileged

registers (col. 10 lines 31 - 44), the processor having access to other memory (col. 11 lines 30 -

52), the method comprising:

        giving the virtual machine access to the privileged registers (col. 10 lines 31 - 44));

        using at least one privilege register at a predetermined interruption point (col. 10 lines 31

- 44); and

        the virtual machine application controlling the context switch (col. 11 lines 30 - 52 and

col. 12 lines 20 - 24).

        Bugion discloses the context switching between host OS and a virtual machine but did

not explicitly disclose using the privileged register as a temporary storage to save the context and

preventing the processor from changing the context while the context is being saved. It would

have been obvious for one of an ordinary skill in the art at the time the invention was made for

VM to use the privileged register in anyway as desired such as a temporary storage because it

has access it. Furthermore, Gottlieb discloses that temporary register are used for temporarily

storing context (col. 4 lines 61 - 64) and preventing the processor from changing the context while the context is being saved (col. 5 lines 1 - 5). Therefore, it would have been obvious for one of an ordinary skill in the art, to combine Bugion's teaching together with Gottlieb because Bugion stated that any available memory space may be used to save the context information when performing context switching (col. 11 lines 39 - 41).

30.   **Claim 12** is rejected on the same grounds as stated in claim 11 above.

31.   Regarding **claim 13**, as modified Bugion discloses the inconsequential register is used as a temporary storage in lieu of a privileged register (Gottlieb: col. 4 lines 61 - 64).

32.   Regarding **claim 14**, as modified Bugion discloses the context is saved at a predetermined interruption point (Gottlieb: col. 4 lines 47 - 52 and 61 - 64, col. 6 lines 45 - 50).

33.   **Claim 15** is rejected on the same grounds as stated in claim 11 above.

34.   Regarding **claim 16,** as modified Bugion discloses the use of inconsequential register is used to pass information to the virtual machine application (Gottlieb: col. 4 lines 61 - 64).

35.   Claims 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bugion et al. (US 6,496,847, hereinafter Bugion) in view of Gottlieb (US 6,298,431), as applied to claim 12 above, and further in view of Applicant Admitted Prior Art (AAPA).

1.   Regarding **claim 17,** as modified Bugion did not disclose the context switched is using an

IA-64 processor. However, according to applicants' admitted prior art, IA-64 processor is

considered a well-known architecture (specification page 1, paragraph 4). It would have been

obvious for one of an ordinary skill in the art, to implement as modified Bugion's invention with

an IA-64 processor to take an advantage of reducing thread switch overhead for improving

processor performance (Gottlieb: col. 3 lines 41 - 45, 63 - 65).

36.   Claims 18 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bugion

et al. (US 6,496,847) in view of Gottlieb (US 6,298,431), as applied to claim 12 above, in view

of Applicant Admitted Prior Art (AAPA), and further in view of Thangadurai et al. (US

7,171,547).

2.   Regarding **claim 18,** as modified Bugion did not clearly disclose the inconsequential

register is a caller-save register. Nevertheless, Thangadurai discloses the inconsequential

register is a caller save register (col. 1 lines 30 - 35, col. 5 lines 37 - 45). It would have obvious

for one of an ordinary skill in the art at the time the invention was made to combine as modified

Bugion's invention with Thangadurai to use scratch register as temporary storage for saving and

restoring instruction execution as desired (col. 3 lines 20 - 34).

3.   Regarding **claim 19,** as modified Bugion discloses the inconsequential register is a

branch register (Thangadurai: col. 5 lines 37 - 45 and fig. 4).

37.   Claims 20 - 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bugion et

al. (US 6,496,847) in view of Gottlieb (US 6,298,431), as applied to claim 12 above, in view of

Thangadurai et al. (US 7,171,547).

38.   Regarding **claim 20**, as modified Bugion did not clearly disclose restoring the context

using the inconsequential register as a temporary storage. Nevertheless, Thangadurai discloses

restoring the context using the inconsequential register as a temporary storage (col. 3 lines 20 -

34, col. 1 lines 30 - 35, col. 5 lines 37 - 45). It would have obvious for one of an ordinary skill in

the art at the time the invention was made to combine as modified Bugion's invention with

Thangadurai to use branch register as temporary storage for saving and restoring instruction

execution as desired (Thangadurai: col. 3 lines 20 - 34, col. 5 lines 37 - 45).

39.   Regarding **claim 21,** as modified Bugion discloses the context is restored by using a

branch register to perform an indirect branch (Thangadurai: col. 3 lines 20 - 34, col. 5 lines 37 -

45).

Response to Arguments

4.   Applicant's arguments with respect to claims 1, 3, 11, 12, 22 and 25 have been

considered but are moot in view of the new ground(s) of rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lilian Vo whose telephone number is 571-272-3774. The examiner can normally be reached on Thursday 8am - 5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Meng-Ai An can be reached on 571-272-3756. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Meng-Ai An/   Lilian Vo
Supervisory Patent Examiner, Art Unit 2195   Examiner
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